Clean Cities International's Reverse Trade Mission
November 19-21, 2002
Sponsored by the Department of Energy
Trip Report

I. Day 1: November 18, 2002

Dinner discussion: We discovered the city of Mexico already has some 500 refuse haulers, 300 fleet vehicles, and around 800 transit buses (microbuses) in use with CNG. The city of Nuevo Laredo is looking at alternative fuels among other possibilities to address air quality issues.

II. Day 2: 11/19

a. CenterPoint/Reliant Energy- *Bob Navarro and John LaBum*

Overview of company: The presentation described how CenterPoint sells gas and service with a product, natural gas, that is both abundant and globally available. The type of service station (slow-fill, buffer, cascade) built is determined by the number of vehicles that will use the station on a regular basis. Through EPACT and the Texas Clean Fleet Program, opportunities exist in the light duty vehicles, buses, refuse haulers, and airport fleets sector, in descending order according to market potential.

1. Facts
   - Price of CNG per gallon is $1.20 compared with $1.40 for regular unleaded
   - Chevrolet is the leader for conversion kits, which CenterPoint does not recommend due to inconsistent results and a much higher rate of failure than OEMs (Original Equipment Manufacturers).
   - The stations have 90% of their clients on a contracted, fixed price basis.
   - Automotive dealers with natural gas vehicles must provide at least one on-site certified mechanic.
   - COMEX runs 3 stations in the Mexico City metropolis
   - According to CenterPoint calculations, the lower CNG fuel costs, and lower maintenance and operating costs outweigh the higher purchase costs of NGVs (Natural Gas Vehicles).

2. Discussion

Maintenance training arose as a crucial issue on both sides. No natural gas program should be instituted without a properly trained maintenance staff, including drivers of the fleet vehicles. The Mexico City attendees also

mentioned difficulties with users refueling and operating the vehicles correctly.

b. **Clean Cities Program- *Marcy Rood***

Thanks to 79 Active Cities, or cities with Clean Cities coalitions, 32,000 metric tons of emissions are reduced each year. A well-rounded coalition includes city and state vehicles, transit systems, fuel providers, dealerships, and environmental groups. Communication must continue between manufacturers and users to work out user issues and changing needs with regards to NGVs. Group collaboration, environmental monitoring, fuel and station availability, and governmental support are all pillars of successful programs. Several US company partners and international agencies, including banks provide assistance to Coalition and local fleets through the Clean Cities International program. Good fleet candidates include high mileage fleets within a central operating area, such as taxis.

1. Facts
   - ✍✍ While the quality of gasoline varies, especially in Mexico, the quality of natural gas remains consistent.
   - ✍✍ Peru offers natural gas incentives for taxis and public transit by giving those vehicles using natural gas the best routes.
   - ✍✍ California offers a high-speed alternative lane on freeways for NGVs.
   - ✍✍ 20 schools nationwide form parts of the National Alternative Fuels Training Consortium

Marcy announced the Clean Cities Conference in Palm Springs, California in May 2003. Delegates may search the Clean Cities website, www.ccities.doe.gov, for information on this networking opportunity to meet and learn from numerous users and technology providers.*

c. **H.E. Butt Grocery Company LNG (Liquefied Natural Gas) facility- *Mike Moynahan and Tommy Johns***

H-E-B has internally developed and financed 22 LNG delivery trucks that can out pull a diesel tractor on a hill at 58 mph. Even climbing a mountain, these LNG trucks have the same performance level compared to the diesel trucks. Because the Caterpillar engines run on a mixture of 92% natural gas and 8% diesel for ignition purposes, the engine does not heat up as much as a dedicated natural gas engine, and even in the case of accidents there are no fires, and the tanks still function. The LNG trucks operate with less noise and can be easily switched back to diesel for resale purposes. Although currently the H-E-B drivers refuel their own vehicles, Tommy recommends a dedicated fueler trained in LNG technology to avoid maintenance problems due to careless refueling measures.

1. Facts
   - ✍✍ Trucks go 700 miles without refueling.
   - ✍✍ NOX (Nitrous Oxide emissions) are reduced by 2 tons per year.
   - ✍✍ 2 tanks in each truck with an average life of 20 years
   - ✍✍ This particular Caterpillar conversion kit sold to HEB cost $31,000.

- While the gasoline and diesel trucks require maintenance every 20,000 miles, the LNG trucks go 40,000 with no problems, including half the oil changes thanks to a cleaner burning engine
- According to Mike, the LNG trucks have an engine life of 140,000 more miles than their diesel trucks.
- LNG offers the advantage, compared to CNG, of less refueling.
    - Therefore the drivers are able to travel greater distances without heavy tanks attached to the trucks or constant refueling.

III. Day 3: November 20

a. Fort Worth Transit Authority- *Dave Sagan*

This group of 111 35-40 foot city transit buses runs on CNG. Preventive maintenance is performed every 14 days on both diesel and CNG buses as mandated by the city. Although the costs of the CNG buses are higher, they generally have fewer problems. Best of all, the natural gas buses have positively contributed to the image of transit in the city with less "big black smoke" contaminating our air and lungs. The buses have equal acceleration, and although each maintenance session is more expensive because of parts and technology, less maintenance action is required each time. Since acquiring the CNG buses in the early '90's, Fort Worth Transit has seen the costs of maintenance and acquisition drop dramatically, which will only continue with increased usage in the future.

1. Fact
    - In comparison with their diesel buses, Fort Worth Transit saves roughly $3,000 in gasoline costs each year. Considering they keep the buses 14 years, this represents a gross savings of $42,000 with natural gas.

b. Mackie plant- *Jim Schick, Tom Jones*

The Mackie facility has 16 Fuelmaker units to refuel 48 forklifts and one floor sweeper in the warehouse. The Fuelmaker is a refueling alternative to a full-service station and is perfect for smaller fleets and applications. Overnight this appliance can fill a tank with CNG so that a user gets the most effective fill possible. Because the warehouse is enclosed, this forklift application is ideal for preventing harmful emission fumes, and the simple fueling process means that the drivers do not experience back injuries due to heavy lifting of propane tanks during refueling.

1. Facts
    - Each unit has 4 compressors that fill at 4.5 gallons per unit per hour
    - Each 4,000 hours the compressors are replaced
    - These larger units cost $22,000 each, while the smallest one runs at $6,000 per unit.

c. Tarrant County College- *Steve Elms, Steve Hull*

This college is one of the 20 schools that belong to the National Alternative Fuels Training Consortium with a nationally recognized alternative fuels training program. Students on site receive both classroom and practical shop experience on a variety of vehicles including natural gas OEMs, conversions, and LPG vehicles, most of which are

light-duty vehicles. Steve mentioned the problems encountered with older conversions, echoing Robert Navarro's complaints about these engines; they have an extremely high failure rate, he claims, due to poor preventive maintenance and improperly trained repair technicians. They require much more "tinkering" to determine problems because each converted engine functions differently according to the vehicle and engine manufacturer. One of the greatest issues to overcome is fuel storage; each vehicle has a large tank that takes up much of its trunk space. Additionally, modern tools and supplies are crucial in a successful training program like this one.

1. Fact
   - ✍✍ Class structure can vary, but a basic certification includes 6-8 different topics, each running from 1 to 4 weeks.

IV. Day four: November 21

a. North Central Texas Council of Governments- *Nan Miller, Eddie Millan*

The North Central Texas Council of Governments houses the Dallas-Fort Worth Clean Cities Coalition, which coordinates a number of alternative fuel projects. Nan Miller, the DFW Clean Cities Coordinator, discussed her Coalition and some of the ways they promote alternative fuels, including their AFV (Alternative Fuel Vehicle) loaner program. This program enables city governments to test the feasibility of AFVs in their fleets. Eddie Millan, spoke about his Coalition in Laredo, which is currently developing a membership base. Eddie would like to incorporate Mexican fleets, especially those in Nuevo Laredo, into his coalition in order to share technology and resources. At present, the Los Dos Laredos Coalition is looking at an alternative fuels heavy-duty project among trucking fleets in the area. Dan Deaton then talked about some of the projects other Coalitions have implemented, especially other border Coalitions.

Thomas Diggs, the Chief of the EPA Air Quality Planning, apologized that the Border Affairs representative was unable to attend. He discussed the Agency's air quality initiatives such as the Adopt-a-School bus program, which encourages businesses to cover the cost of a school bus switching to a cleaner fuel, for example, natural gas. Many of the EPA's initiatives are voluntary programs aimed at the business community.

b. Dallas/Fort Worth International Airport- *James Green, Tomas Rivera*

DFW Airport Board has a commitment to use low-emission vehicles, with a primary focus on CNG vehicles. The airport has a new onsite CNG fueling station that serves their CNG fleet. The airport began purchasing natural gas vehicles about three years ago and has been very pleased with their performance and reliability. Tomas showed us a Honda Civic GX, purchased in 2000 with over 150,000 miles on it. The vehicle is used as an escort vehicle with an operating schedule of 24 hours a day, seven days a week, and it is subjected to long periods of idling. Tomas also presented a de-icer, a dumptruck, and other off-road equipment that had been specially ordered with CNG engines.

V. Websites

www.ccities.doe.gov/international- Clean Cities International website
http://naftp.nrcce.wvu.edu- National Alternative Fuels Training Center: Provides studies, information, and links to answer all your alternative fuels questions and needs
www.ngvc.org- Natural Gas Vehicle Coalition
www.gastechnology.org- Gas Technology Institute
www.iangv.org- International Association of Natural Gas Vehicles
http://fleets.doe.gov- Fleet Manager Tool
www.npga.org- National Propane Gas Association
www.evaa.org- Electric Vehicle Association of the Americas

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